IDAHO NATIONAL ENGINEERING
ENVIRONMENTAL LABORATORY PUBLIC MEETING

Proposed Cleanup Plans for Naval Reactors Facility
and Argonne National Laboratory-West

FINAL

January 22, 1998
Idaho Falls, Idaho
6:30 p.m.

ORIGINAL

Nancy Schwartz Reporting
2421 Anderson Street
Boise, Idaho 83702
(208) 345-2773

IDAHO FALLS, IDAHO, THURSDAY, JANUARY 22, 1998

MR. SIMPSON: Welcome to tonight's meeting. I also want to welcome those who are receiving extra credit for being here. I'm Erik Simpson. I'm the INEEL Community Relations Plan Coordinator for the Environmental Restoration Program.

We're here tonight to discuss the results of two Comprehensive Remedial Investigation/Feasibility Studies. These are environmental investigations. The first involves Argonne National -- first involves the Naval Reactors Facility, which is managed by the DOE Naval Reactors Branch. The second project that we're going to be discussing tonight involves Argonne National Laboratory-West, which is managed by DOE-Chicago because of its ties to the University of Chicago.

As you'll see from both of these presentations, these facilities have had a lengthy past in developing nuclear reactors and research and technology. And we're here tonight to discuss the resulting contamination problems and the steps that the Department of Energy, Environmental

Protection Agency and the state of Idaho are recommending for cleanup.

This meeting represents the 16th time that we've come out with a proposed plan and asked for your input. The last time we were here was in March of 1997 when we were accepting comments on the Test Reactor Area Comprehensive Remedial Investigation/Feasibility Study, and I should mention that the agencies have signed a Record of Decision on that project, and I have a copy of the documents at the back of the room. If you would like a copy, see me during the break, and I'll take your name and address, and I'll get you a copy.

I would like to go over the agenda right now. Following the introduction, Rick Nieslanik is going to be giving an overview of the Superfund processes and how we conduct risk assessments. Then Margi English from the state of Idaho and Keith Rose from the EPA will give some brief comments on their involvement with the Naval Reactors Facility Comprehensive Investigation. Following that, Andy Richardson, Mark Hutchison and Bruce Olenick will give their presentations, and then we'll have a question-and-answer period where you can ask questions of the project managers.

I should also mention that we do have some cards at the back of the room. If you would like to write down your question and give them to me, I can give them to the project managers. Following the question-and-answer session, we will have a public comment session where you can make a comment for the record. We have a court reporter here tonight who is recording all portions of this meeting, and I'll talk about that in a little while.

Then we'll have about a 5- to 10-minute break, and then we'll come back and discuss the Argonne National Laboratory-West Comprehensive Investigation, and our state and EPA representatives are Daryl Koch, and, once again, Keith Rose. Greg Bass from DOE-Chicago and Scott Lee from Argonne will give the presentation, and, once again, we'll have a question-and-answer session.

I would also like to point out that on the back of the agenda there is a meeting evaluation form. Please take a few moments and jot down your impressions of this meeting. Give them to me. And this -- we'll use this to shape how our future meetings are conducted.

With that, I would like introduce Rick Nieslanik. He's been part of the Environmental Restoration Program since the beginning, and he's going to talk about the Superfund process and risk assessment.

MR. NIESLANIK: I would like to welcome everyone here tonight. This is a lot bigger crowd. We've done this presentation at several locations, and this is by far a bigger crowd and we're glad to see it. During each of the presentations tonight, if you can hold your questions until the end and make some notes or whatever, that will allow us to move along a little better and keep us from being here all night.

First of all, I'd like to start out by giving you an overview of the process that we use. As you hear the two different projects, the presentations on the two projects, you're going to see some things that are very similar about the two projects and you're going to see some things that are quite different between the two. The differences are based on the site-specific information that the two sites came up with in their investigations. The similarities are the process that we use to develop that information and to gather all the data that we need to make a decision with.

These projects are governed by a law called a Comprehensive Environmental Response Compensation and Liability Act. It's quite a mouthful, so we use an acronym, CERCLA, for it. You'll also hear us use the word Superfund. That's just another name for that same regulation. The three agencies that are involved in this project and cleanup at the INEEL are the Idaho Division of Environmental Quality, the U.S. EPA and the U.S. Department of Energy, got together and formed an agreement called the Federal Facility Agreement and Consent Order. You'll hear that referred to as the FFA/CO and also as the agreement later on tonight.

What that agreement lays out is how the agencies work together to come up with the right decision for what to clean up and how clean they have to get things. This agreement also lays out some steps we take to scope the jobs, to say how big of a problem do we have at each one of these individual locations and how are we going to gather the information we need to assess that. We came up with what we call a Track 1 and a Track 2 scoping process. And I bring those up because, again, during the presentations you're going to hear those terms and I would like to explain what they are.

In a Track 1 process, we gathered up all the existing information that we had on a particular location. We found a site where we thought something might have been disposed of. We went off and we gathered old photographs. We talked to retired employees, long-term employees. We looked at operational records and we looked for all old sampling data that we might have on those areas, and then we made a decision. One, do we have enough information to decide we need to clean it up? Do we have enough information to decide that we don't need to clean it up, or do we need more information, do we need more data?

If we need more data on a particular site, then we went to a Track 2 process. A Track 2 process is basically a limited sampling evolution. Rather than go to a full-blown sampling evolution on the site, we would take a few samples and then make the same decision again. Do we have enough information to proceed? Do we need more information?

At the end of either one of these two

scoping evolutions, we could go to a removal action. A removal action is just what it says. We could go remove the contamination that was in the soil, or we could go to an interim action. An interim action is basically the same thing but a little bigger. If it was a smaller area, we could do a removal action. If it's a big area, we would have to do more paperwork and more investigation as part of that cleanup. And then finally we could do a Remedial Investigation/Feasibility Study. That is a full-blown, large number of samples, big investigation, and we did that on some individual sites.

What we're talking about tonight, we call it a Comprehensive Remedial Investigation and Feasibility Study. Now, the real difference between these two is simply that in this comprehensive investigation, we go back and we look at all these decisions we made before, all of the scoping decisions that we don't need any more information or that we cleaned up a site, and we go back and reevaluate that and decide if that was the right decision, or if we need to reevaluate that when it compares to all the other areas on site.

Now, what we're talking about tonight

are two areas, one called the Naval Reactors Facility or WAG 8, Waste Area Group 8, and Argonne National Lab, which is Waste Area Group 9. As you might guess, 8 and 9, there must be a 1, 2, 3, 4, 5, 6, 7 and also a 10. We're not going to talk about those. Those are the subjects of other investigations and there will be public meetings on several of those over the next few months as well.

In all of those individual steps that I described earlier, there is an element of risk assessment, and the risk assessment process is really what we use to make the decision. You gather all this data and we have to have a framework, if you will, to evaluate that data to decide what needs to be cleaned up and what doesn't. The risk assessment consists of four basic steps. One, identify the contaminants of concern. That's all that sampling that I was talking about and the research that we did and the existing information, if you will.

Then once we've identified those contaminants, we do two things. We assess the exposure. How does that contaminant that's in the ground get to an individual, to a human receptor or to an ecological receptor, how do they get exposed. And also a toxicity assessment, how toxic are those chemicals. Each individual chemical, each individual contaminant that's in the soil, we went off and look and say, okay, what's the toxicity of that, and how is that going to affect a human receptor, and how is that going to affect an ecological receptor, the animals and the plants. And after we do that, then we characterize that risk. We have to tie all that together into one usable number to help us in that decision that we're going to make on what to clean up.

On the exposure assessment, we look at the different pathways that we can get contamination that might be in the soil, to an exposure to an individual or to an animal, to an ecological receptor. What we calculate is called the reasonable maximum exposure. It's not the maximum that someone could dream up, but it's a reasonable amount. And it's not the minimum. We do take into account a lot of different things so that we get a good conservative, protective assessment of exposure.

These are the different pathways we looked at. For radioactive constituents, we have what we call direct exposure. Radioactive elements give off energy and that energy is exposure by direct irradiation. We look at groundwater. If there's contaminants in the soil, rainwater, irrigation, those kind of things can drive that down to the groundwater. Then it can be pumped out onto the ground or into a piping system, and we can have an exposure either to inhalation during a shower scenario or drinking it, an ingestion pathway, or even an absorption pathway through your skin, again, during a shower.

We look at dermal exposure. Dermal exposure is digging in the soil, getting the contaminants on your hand and having that absorb through your skin. We look at inhalation. If there's a contaminant in the soil, it could come up as a vapor or as dust, get in the air and then you could breathe that. We look at soil ingestion. Whether you believe it or not, each one of us consumes a certain amount of dirt every day, and so we have a soil ingestion pathway that we have to look at.

Then finally we looked at a crop ingestion pathway. If a person were to grow vegetables in contaminated soil, how much of that contamination would uptake into the plants and how much would we eat, and, therefore, what would our exposure be. As part of that we also looked at irrigation with contaminated groundwater. Then finally, I'll repeat again, we then looked at the ecological receptor. We looked at mice and birds, antelope, deer, plants, all the different ecological receptors we thought would be out there at the INEEL.

Then we assess the toxicity. Two things we look at when we talk about toxicity, carcinogenic effects and noncarcinogenic effects. Those things that cause cancer and those that do not. Carcinogenic effects, we have what we call a slope factor. Now, this value is something that's published for each individual contaminant by the EPA. It's a compendium, a gathering of all of the research that's been done, and they come up with this value. What it represents is that for some exposure, some dose that we calculated in our previous step, we can estimate what the response would be. We represent that response as the risk of getting one additional case of cancer. It's presented as a number of one in a million or one in 10,000.

Now, we all have a different perception

of what's an acceptable risk. A lot of us -- most of us probably feel that it's a perfectly acceptable risk to fly in an airplane. Other people may find that to be an unacceptable risk. We make risk decisions in our lives every day. We drive. Do we drive 75 miles an hour? Is that acceptable? To most people it is if it's on the highway. Other people, it's not. We make assessments based on site conditions. We may not to want to drive 75 miles an hour in the snow, but we might in dry conditions. Those are personal risk decisions that we make, but the risk managers, the agencies involved in these decisions, they need a guideline by which to make these risk decisions.

So they've defined in the National Contingency Plan, which is one of documents that comes out of the regulations and I talked about earlier, the CERCLA, and the National Contingency Plan says that the acceptable risk range is between one in 10,000 and one in a million. That is additional cases of cancer based upon that calculated exposure.

Sometimes you will see that there is a risk just slightly above or slightly below and the agencies will have to decide what to do with those, and when they do that, they look at the uncertainty in all those calculations I've just talked about. What's the uncertainty in this value, what's the uncertainty in that reasonable maximum exposure that I talked about earlier, what are the uncertainties associated with each those pathways that I talked about. So there's a lot of uncertainty assessment that goes into this decision.

The other thing that we looked at is noncarcinogenic health effects. Now for this one we use a different value. This is called a reference dose. For noncarcinogenic effects there is some level below which there is no observable adverse effects. We would not expect to see any adverse effects in those ranges. And, again, this is based upon all of the research that has been done around the country and these are published values by the EPA. So the risk assessors take that value and compare it to that estimated exposure that I talked about earlier. Only this time we come up with a value called a hazard quotient. A hazard quotient is simply a ratio between that estimated exposure and this reference dose.

So if the estimated exposure and the

reference dose are the same, we have a hazard quotient equal to one. If the estimated exposure is greater than the reference dose, then the hazard quotient will be greater than one and vice versa if it's less than. Again, a hazard quotient of one is the value that the risk assessors use as a baseline. Now, if we go above that, does that necessarily mean that's unacceptable? Well, not really, because, again, there's some level down here above the reference dose even where there's no observable adverse effects. So those are the kind of things that the agencies will take into account when they decide what's an acceptable hazard quotient and, therefore, what needs to be cleaned up, based on those values.

I want you to keep in mind as you listen to the presentations tonight these things: That when you look at a decision -- when you've got to make a decision on what to clean up, you're going to go to these risk values, what's the hazard quotient and what's the calculated risk. It takes into account a lot of things. How a person is exposed, what the toxicity of each of the chemicals are.

Does anybody have any questions on any

of this before I turn this back over to Erik to introduce the next set of presentations?

AUDIENCE MEMBER: Are these numbers -- are these the national numbers or are these the local DOE numbers?

MR. NIESLANIK: The question was, are these local values or national EPA values. The reference dose and the slope factors are nationally published by the EPA. They are in a series of documents, the health effects assessment tables that you can pull off -- you can get them off the Internet now.

AUDIENCE MEMBER: It's a standard?

MR. NIESLANIK: It's a standard value.

AUDIENCE MEMBER: Back to your previous slide, I wasn't sure I understood it.

MR. NIESLANIK: What I'm talking about here is a slope factor.

AUDIENCE MEMBER: The one before this. I'm sorry. The carcinogenic.

MR. NIESLANIK: The important thing here is the difference between this and the one I talked about just a minute ago. This slope factor, if you notice for any increase in dose, there is an increase in response -- in the effect, whereas the other one, there's a level below which there is no effect for low doses.

AUDIENCE MEMBER: Isn't that true for radiation exposures too?

MR. NIESLANIK: Yes. This is the way that the EPA risk calculations go: They consider radiation, radionuclides as carcinogenic so there is a slope factor for --

AUDIENCE MEMBER: The other one had a threshold sort of thing, and you don't have one here. You have a linear dose.

MR. NIESLANIK: Right. That is the way that these calculations assess radiation. They use this approach, which is a little different than just calculating the millirem that a person would receive. It is based on and makes the assumption that any amount of exposure does result in some response, however small that response may be.

AUDIENCE MEMBER: The question in my mind is, I've seen information that indicated that below some threshold you don't have a linear response.

MR. NIESLANIK: There is a lot of uncertainty. Again, I talked about the uncertainty. There's a lot of uncertainty in these slope factors. They are based on a lot of research and they're based on the best information that the EPA has available. But, again, you've got to keep in mind what we're trying to do with this data. We're not trying to determine how many people are going to get cancer. What we're trying to do is come up with this value that the risk assessors, that the agencies are going to use to make a decision on what to clean up, and this framework that we're using is prescribed, and it allows us to compare radioactive exposure to nonradioactive carcinogens, and so it's more a matter of giving us the data we need to make a decision, not estimating how many people are going to get cancer.

Any other questions? Okay.

MR. SIMPSON: To help out the court reporter, we're going to start using the microphone. I feel like a Congressman. At this time, I would like to introduce Margi English, who is with the state of Idaho, Department of Health and Welfare, Division of Environmental Quality, and she was a project manager for Waste Area Group 8, and also Keith Rose who is with the EPA's Region 10 office in Seattle. They're going to make a few statements.

MS. ENGLISH: I want to welcome you all here. It's really good to see so many people come out and have interest in what we're doing on the INEEL. Can everybody hear me? It's hard for me to tell up here if the microphone is working.

I've worked together with EPA and the Naval Reactors Facility for the past five-and-a-half years addressing potential past contamination release sites at the Naval Reactors Facility. And during that time we've evaluated certain sites -- fully evaluated certain sites, made some remedial decisions. We've conducted a couple of removal actions, and we've successfully conducted a remedial action for several existing landfills on the NRF.

We're real happy to say that those previous cleanup actions have been conducted within -- on schedule and within budget, and at this point in time in the process, we're turning our attention to the remainder of the sites on the NRF, as well as looking at all of those previous decisions in a more cumulative, overall aspect, and some of the later presenters will explain that in more detail.

Throughout the process of this final

remedial investigation, the state has participated in development of the investigation and scoping the investigation. We've worked to develop the risk assessment once we have gotten data. Also the state, together with the NRF and our EPA counterparts, have developed and screened potential cleanup remedies for the site, as well as fully participated in developing and writing the proposed plan that you all have copies of.

Where we are right now is, we're at a point in the process where we really welcome and encourage public participation into the remedial decision selection. I want to emphasize tonight that even though the proposed plan identifies a preferred cleanup alternative, the agencies have not yet selected a cleanup remedy to implement, so therefore, it's very important and I want to emphasize to you all that you should comment on all of the remedial alternatives in the proposed plan, not just on the preferred alternative, and also, if you feel that there are any options that the agencies have not considered, we would really welcome your input on that.

We will take your comments and your opinions and we'll then use those to help us select the final cleanup remedy for the sites that you'll hear about tonight, and those final remedies will be documented in a Record of Decision that will be finalized later this year.

Tonight, if you have any questions about the sites or about the remedy selection process, please don't hesitate to ask. We will be very happy to answer your questions. With that, I'm going to turn this over to my EPA counterpart, Keith Rose.

MR. ROSE: Good evening. My name is Keith Rose. I'm EPA's project manager for the Nuclear Reactors Facility at INEEL. Myself and my fellow project managers at EPA, who were prior managers on this project, to myself, have reviewed and approved the remedial investigation and feasibility study for the NRF facility, and I have also reviewed and concurred on the proposed plan for NRF. Specifically concurred with -- or EPA has concurred on the selection of a preferred alternative, which you are going to hear about later on for NRF.

This -- our concurrence on the preferred alternative is based on seven of the nine criteria that EPA uses to select an alternative, a remedial alternative. These seven criteria include such things as protection of human health in the environment, meeting environmental regulations, short-term and long-term effectiveness and implementability and cost. The two remaining criteria, which we are looking for input on, are state acceptance of the preferred remedy and community acceptance of the preferred remedy and any other comments on any other of the alternatives which were proposed. So our final decision would be based on those two final criteria along with the seven other criteria.

Our final decision will be embodied in a Record of Decision as Margi referred to, which will be issued later on this year. I will be available later on for questions or comments after the presentation. Thank you.

MR. SIMPSON: I've noticed that only a fraction of people who are here tonight have signed in. When we have a break, please do so. At this time, I would like to introduce Andy Richardson. Andy is with the DOE Naval Reactors Branch, and he will talk a little bit about the Naval Reactors Facility background and this comprehensive investigation.

MR. RICHARDSON: Good evening. Can everybody hear okay? As Erik said, my name is Andy Richardson. I work in the local Naval Reactors Idaho branch office out at the Naval Reactors Facility. Actually my office is in that building right there. What I want to talk to you about briefly this evening is a little bit of the history of the Naval Reactors Facility, some of the activities that took place out there and how some of those activities got us to the point where we think we need to do some cleanup action.

Back in the late 1940s the decision was made that the United States was going to go build nuclear-powered submarines. That job was given to then Captain Rickover, said go out, build us a nuclear-powered submarine, do it right, let us know when it's done. That's essentially what Captain Rickover did. He did a lot of research, came out to Idaho and what was then called the National Reactor Testing Station in 1951, established the Naval Reactors Facility. It was much smaller than this in 1951.

They commenced construction on the S1W prototype. That was the prototype plant, test plant, if you will, for the submarine Nautilus, which I'm sure most of you all have heard of, the first nuclear-powered submarine. As things moved along more quickly in the '50s than they do in the '90s, by March of 1953 the S1W prototype was actually operating at power, proving that you could use nuclear power to push submarines through the water.

Consistent with the technology and use back in the '50s, part of the S1W prototype complex was a system that allowed for discharge of radioactive water from the prototype plant out to originally what was called a tile drain field. A tile drain field is not much more then a relatively large concrete pipe buried about 10 feet under the surface of the ground. At that end of the pipe you have a bunch of holes. Water goes out, not surprisingly leaks out the holes that are intentionally in the pipe and into the soil. The idea being that the contaminants that were in the radioactive water would be caught up in the soil and immobilized.

That actually worked pretty well, because by 1955 this drain field wasn't working as well or it wasn't draining as well as it had originally, and the decision was made to expand this discharge point to what's called the S1W leaching pit. The concept was the same. You discharged some of the radioactive water out to the soil, with the contaminants getting entrained in the soil.

About the same time, mid-'50s, a couple of other major developments took place at the Naval Reactors Facility. First being the decision that not only were nuclear submarines a good idea to have, but it certainly seemed that a nuclear aircraft carrier would be good thing to have. So the program, in 1957, placed the A1W prototype in operation. That was the prototype for the aircraft carrier Enterprize which, in fact, is still out operating today, the first nuclear powered aircraft carrier.

Also in 1957, 1958 time frame, the Navy built the Expended Core Facility, also in operation. This facility, now that we've had some operating reactors for five years or so, was built so we could take those reactor cores that had been in use, bring them to this facility and inspect those cores, make sure that those cores, in fact, performed the way that they were designed to perform from a corrosion standpoint, from a strength standpoint, make sure that they did what we thought that they were going to do.

Along with these two facilities, obviously there became other opportunities to discharge some of the water. For the A1W reactor plant, we built on the west side of the facility another leaching bed similar to the ones that we had used for the S1W facility. This was another receiving point for radioactive water discharges from the A1W prototype. Similarly, the Expended Core Facility had radioactive liquid discharges. Those were, in some cases, sent over to the S1W. It's what we call this discharge complex if you will.

So that gets us through the late '50s. We have two operating reactor plants. We were conducting research and development on propulsion systems for ships. We were performing inspections and research in development on materials so we can build better cores. About the mid-1960s we decided to build yet another prototype reactor plant. This was called the S5G Reactor Plant that was a significant upgrade in the technology. It put us in a position where we could run a reactor plant that did not require pumps to move cooling water through the actual reactor.

That provided a couple significant advantages to the Navy. It let us build submarines that were much quieter because you didn't have to have these big pumps moving water around. It also provided you an inherently even more safe design than you already had because in the event -- if you don't have to have the pumps to move the cooling water, you're always assured that it's going to move through the core and remove any heat that's there.

In this same time frame, in the middle 1950s, based on lessons we learned from the operation of some of this discharge points a program -- came to the conclusion that it was a smarter idea not to discharge these liquids out to the environment, and we started working in the late 1950s, on systems that we could use to recycle, reuse that radioactive water. Okay. And we started placing some of those early systems in use in 1972 and, by 1979, in fact, had ceased all discharges of these radioactive liquids to the environment.

So that essentially leaves us -- well, that put us in a position by the late '70s where you had the three operating plants and the Expended Core Facility. Starting in 1989 these three prototype reactor plants were sequentially shut down, S1W in 1989, A1W in 1994 and this S5G in 1995. Currently, the Expended Core Facility is the main operating facility out there at NRF.

So getting back to this idea of the Comprehensive Remedial Investigation that Rick talked about earlier, over the last five years or so we've done a lot of investigation all over the site. But primarily due to these radioactive discharge points, we feel that the sites of real concern, the sites that we really think we need to go off and take some sort of cleanup action on are the nine sites that are shown on this picture.

A couple of my counterparts will be coming up. They will go into a little more detail on these particular sites, and if there aren't any other questions on the historical aspect, I would like to turn this over to Mark Hutchison who is one of the primary engineers throughout this entire investigation process for the Naval Reactors Facility.

AUDIENCE MEMBER: How was the record-keeping for the type of waste that was discharged -- I know that there was radioactive, but maybe possibly other things. How was the record-keeping for NRF?

MR. RICHARDSON: The record-keeping at NRF actually has been quite good. For instance, if you go to this warehouse building, you can still go and find what were chemicals which routinely are a problem out at the INEEL as a whole. You can find what are called traveling requisition cards that show every chemical that was bought for use at NRF and how much of it was bought and when it was bought, going all the way back to 1951. The radioactive discharge records are, in fact, excellent. Any other questions? Okay. I would like to turn this over to Mark.

MR. HUTCHISON: Good evening, everybody. I hope you will bear with me. I'm munching on a cold tablet and hopefully it doesn't come flying out while I'm talking. I'd like to begin by briefly going over the CERCLA process at the Naval Reactors Facility. We had 71 identified sites at the Naval Reactors Facility that required us to go off and do some kind of investigation assessment, evaluations. Those are the kind of words that we use to look at these sites and evaluate them. Ten of those sites were included in a previous Record of Decision. The Record of Decision included three remedial actions where we placed landfill covers over three landfill areas.

We had 43 other sites that were looked at through a Track 1, Track 2 type of investigation that Rick discussed earlier. The conclusion of these investigations were we did not require any further investigation of them. And that leaves us with 18 other individual site assessments that were included in this comprehensive remedial investigation and feasibility study, which I'll try to call "the study" from now on. This comprehensive study looked at these 18 sites and did a cumulative assessment of all the identified sites at the Naval Reactors Facility and came to the conclusion like Andy was talking about earlier, that we have these nine sites of concern that we need to go off and do some action with.

That brings us to the point right now of the public comment where we receive the public comments on our proposed and preferred actions, and later on we will go into a comprehensive Record of Decision where we'll have a responsiveness from this summary which will address the public comments that we receive during this public comment period. On down the road we'll have a remedial design, remedial action phase where we actually go into implementation of whatever actions are chosen. It includes some monitoring, and even further down the road is what we call a five-year review period where we actually go back and look at the effectiveness of the actions that have been selected.

The comprehensive study involves five primary tasks. We did this individual assessment of 18 potential radiological sites. It included a cumulative assessment of all 71 of the identified sites at the Naval Reactors Facility. We developed what we call remedial action objectives. We developed and evaluated various remedial action alternatives, and then finally there was a selection of a preferred alternative.

I'm going to talk about the first two of these tasks. The first one was the individual site assessments. We had 18 potential radiological sites that we had to go off and look at the history of them and gather as much information on the discharges to them, pull out old documents, anything that we could find that had information on these 18 sites. This led into a sampling phase where we collected surface and subsurface soil samples and groundwater samples from a groundwater monitoring network that surrounds the perimeter of the Naval Reactors Facility. All this information was brought in together and used in a human health risk assessment for each of the sites.

The conclusion of this human health risk assessment was, we had these nine sites of concern. The cumulative assessment of this comprehensive study evaluated the 71 sites that we had identified at the Naval Reactors Facility and looked at the potential additive effects of all these sites on a potential receptor. The conclusion of our comprehensive cumulative health assessment was we did not identify any additional sites of concerns, other than the ones that we found during our individual site assessment.

We performed an ecological risk assessment that evaluated potential impact to environmental receptors. This ecological risk assessment concluded that the steps we take to be protective of human health will also be protective of the environment, and so there was no additional actions that needed to be taken as far as the environmental receptors go. We also included a hydrogeological study which assess the potential impacts to groundwater. The information that we got from this hydrogeologic study was used for the human health risk assessments and evaluation of some of the pathways that we had there, the groundwater ingestion, the fruit, crop irrigation ingestion pathway.

The cumulative assessment as a whole came to the conclusion that the sites we identified during our individual site assessments were the primary sites of concern and that's the nine sites that we had discussed earlier.

The human health scenarios that we looked at during our risk assessment included a residential scenario and an occupational scenario. The residential scenario, we looked at a 30-year future resident. We looked at a 100-year future resident. The occupational scenario, we looked at a current worker out there right now, a 30-year future worker. We have highlighted the 100-year future resident, and that is our primary scenario of concern. Part of the reason for that is there is an assumption made that there is going to be some type of institutional or governmental control of the area for the next 100 years. You're not going to have a resident building a home or establishing a residence out at that site within the next 100 years.

For the occupational scenario we have controls in place. We have procedures in place that protect the workers, that keep the workers from digging into these areas and becoming exposed to some of the contaminants that are there. The risk assessment that we performed identified nine contaminants of concern. We had eight radionuclides and one inorganic metal lead. The ones that are highlighted, cesium-137 and strontium-90, were by far our risk drivers. They were the ones that showed the most risk for these sites. We had one site where we detected lead above the EPA screening level for a recommended cleanup.

This slide here is a bar graph that shows these sites of concerns and where they fell as far as the risk goes. This is that one in 10,000 level that Rick had talked about earlier. Seven of our nine sites are above that level. It's obvious that they are human health concerns and that's why they are sites of concern to us.

There's two other sites. One here, the A1W/S1W radioactive line which is actually below one in 10,000, but there's some uncertainty associated with that line. It's an underground line that has leaked in the past, and there is a potential that contaminants are there that would cause the human health risk to be above the one in 10,000 level.

The S1W retention basins are concrete structures that held water at one time. There's reason to believe, historical evidence, that these basins leaked at one time and the potential for soil underneath the basins above levels that would be a human health concern. And we had 52 other sites that had risks in or below this range or even no risk at all because there was not a source present. These 52 sites are going to be recommended as no additional action, and Bruce will talk about those a little bit later.

At this point, I'm going to turn it over to Bruce Olenick who will continue on with the presentation.

MR. OLENICK: Okay. Let me review. Just take a moment to go back and review real quickly what we've been talking about. Andy went through some of the history of the discharges of the facility, the three different locations of the reactor power plants and the types of leaching fields that we had at the facility. Mark went through and discussed some of the risks involved and how we calculated those risks, essentially for each of those nine sites of concern that are located on this chart over here. Given those nine sites of concern, the next step in this process is to say, now what? How do we go about cleaning up these sites?

Well, the first step, in order to do that is to create remedial action objectives. All those are is just a fancy-name for goal in order to achieve the types of cleanup levels that you would -- you're going into this to accomplish. These goals can be summarized or divided into two basic groups, the first being protection of human health. The first goal is to prevent the direct exposure or the ingestion of soil or food crops that were grown on these individual sites 100 years in the future for the 100-year future residential scenario that would result in any excess cancer risk of that one in 10,000 to one in one million range.

Another goal or remedial action

objective is to prevent any exposure contaminated with lead at that lead screening level at 400 ppm recommended by the EPA for cleanup. On the right-hand side of this, note that those contaminants of concern that Mark mentioned earlier, cesium-137 and strontium-90, these levels right here are the levels in which we will go out and clean up those nine sites of concern. Those are based upon 100 years in the future. Anything that is left above those individual limits will present a potential risk to a human receptor 100 years in the future. Anything below that would be acceptable risk. And then the lead, once again, is that recommended EPA screening level for cleanup at 400 ppm.

Given that, there's also goals that we establish for the protection of ecological receptors, as mentioned earlier. The primary goal is to prevent the erosion or intrusion by plant or animal species into these nine sites. In addition to that is to prevent any type of exposure to these ecological receptors to the contaminants of concern located at these sites.

Through this process we evaluated many different alternatives to go off and address each of these nine sites. Going through that process we've narrowed it down to four alternatives that we've selected for full evaluation. The first one being the baseline scenario recommended by the EPA is a no-action scenario. That particular action involves doing nothing, having no controls in place and doing no additional monitoring than what the facility currently does.

The second proposed response action is called limited action. That action invokes long-term monitoring and also institutes control over the control period of 100 years. In other words, fencing, barriers, signs, those type of things to limit access to those nine sites of concern.

The third action that was considered is called limited excavation, disposal and containment. Essentially what that is, is kind of a fancy name for consolidation of those nine areas into essentially two areas. What that would involve is just building on number two. Note that long-term monitoring would still be in place. Institutional controls would be invoked and then consolidating the soil of six of the smaller sites at the Naval Reactors Facility into two of the larger sites. That soil consolidation, once accomplished, two engineered caps would be built over both the S1W leaching bed complex and the A1W leaching bed complex. The purpose being to -- once again, remember those goals we talked about -- to eliminate intrusion by plant or animal species into those areas of concern.

The last proposed action that we evaluated was a complete excavation and removal, taking all the soil volume for those nine sites, packaging it up and disposing of it at a location off the Naval Reactors Facility itself. For that particular alternative, no long-term monitoring or controls are necessary because all the contamination is actually moved off site. So given that -- I think Keith, a little earlier, mentioned the nine criteria that the EPA uses now to judge the difference between those four proposed actions.

These nine criteria -- and I'll summarize them once again very briefly -- the first two being threshold criteria that essentially you look at those two and see how those four actions or proposed actions measure up, protection of human health and how they comply with all applicable laws. The next two, long-term effectiveness and short-term effectiveness were looked at. Long-term effectiveness would be how well does that alternative actually clean up the site over the long haul. And short-term effectiveness: how good is it at protecting workers as they are performing that action.

Treatment is another evaluation criteria that's used. Although, if you notice, none of those four alternatives had treatment as a selected option, so that was eliminated. Ease of implementation: how well can we do this and how easy can we perform each of these actions. And finally, cost. How much do these cost? What's the bottom line to the taxpayer and how fiscally responsible can we be? The last two, state acceptance and public acceptance, again, Keith mentioned that briefly. The primary emphasis here is this meeting. This meeting is seeking your input here into these proposed alternatives.

Now, if we compare those four alternatives, if we break them down into their component parts, notice that Alternative 1, the no-action alternative was screened out based on that evaluation criteria because it was not protective of human health and the environment. That left us with three. And if you notice, I used kind of some buzz words here to keep them fresh in your mind so you can identify back again to that earlier slide. Alternative 2, fence and monitoring. Alternative 3, consolidate and monitor. And finally Alternative 4, complete removal of the contamination.

If we look at those criteria that we mentioned earlier, here on the left-hand side of the slide, kind of a consumer report table here so you can kind of visually see what's going on, notice Alternatives 3 and 4 best meet protection of human health and complying with all applicable laws. Note that Alternative 2 does not meet any of that. It's just less efficient in meeting those particular criteria than the other two alternatives. Long-term effectiveness, obviously a complete removal of all contamination at the Naval Reactors Facility from those nine sites of concern is the best mode of operation when it comes to long-term effectiveness. And then obviously, the next two, doing actually nothing is the least effective.

Short-term effectiveness is the inverse

of that. Obviously, excavating all nine sites at the Naval Reactors Facility would require lots of worker exposure. That would be the least effective. Whereas doing nothing, again, wouldn't expose the local worker to the types of exposures encountered in Alternative 4. Implementability, once again, very similar to short-term effectiveness, obviously doing nothing is the easiest, and complete removal is the most difficult, which brings us to cost. Cost is kind of self-explanatory.

I just wanted to briefly mention that, again, most of this is monitoring cost over a 30-year period. $9 million is, again, that consolidation of six of the smaller sites into two of the larger ones. Then finally, the increased cost here is actually excavating all nine sites, the last two being the largest sites that would have to be excavated and moved off site, so hence, the increase in cost there. So looking at that list, Alternative 3 was chosen as the preferred alternative based on all seven criteria weighed against one another and looking at what is the best one that we can accomplish both cost-wise, short-term effectiveness, all those different criteria that we used.

Alternative 3, what it does is essentially take the six sites located around the S1W complex there, take the volume of soil, the maximum we calculated for contamination of those areas, and place it into what is known as the S1W leaching bed. The S1W leaching bed has a volume of about 90,000 cubic feet. Those six sites, the maximum amount of contaminated soil we have calculated is about 60,000 cubic feet. That volume fits nicely in there with another, approximately, third to go for any contingency built in.

But those six sites once placed in the S1W leaching beds with -- an engineered cap would be developed over the top of both the S1W leaching pit and leaching beds because of their close proximity to one another, as well as an engineered cap placed over the A1W leaching bed on the west side of the facility. What that does is reduce the footprint, the contamination footprint at NRF, into two sites that can be easily monitored and tracked.

Finally, institutional controls and long-term monitoring would be invoked to prevent any type of human intervention into those areas, and also, like Mark mentioned earlier, we have a network of monitoring wells around the facility, kind of encircled on the south end of the facility, to monitor and ensure that these remedies remain protective of the environment and human health.

Just a quick example of the types of engineered caps we're considering. The next phase of this, after the Record of Decision, after getting your input and concerns -- and looking at if this alternative is the selected alternative, those caps are evaluated on their effectiveness and how well they can contain that material. Notice that on top, 24 inch nominal rip rap which are large boulders partly due to prevent, again, that intrusion from plant and animal species in those nine sites of concern.

So basically in summary, going back to the very beginning now, through all the risk assessment we have identified nine sites of concern at the Naval Reactors Facility based on human health concerns. Those nine sites require some sort of remedial action. We did a cumulative assessment that didn't identify any added effects from all those 71 sites we had at the facility that we evaluated. We've identified four remedial action alternatives. We've evaluated those alternatives compared to that criteria of nine that we mentioned earlier. Selected the third alternative as the preferred alternative which essentially is excavating six of the smaller sites, consolidating it in a larger site and building engineered caps over two of the sites, and then a long-term monitoring program.

In addition to that, 52 sites are recommended as requiring no additional action. That's basically split. Eleven sites still have a source present but located deep underground. Eleven of those sites will be continually rolled into the process and reviewed on that five-year review process to ensure that the actions we perform remain protective of the environment. The other 41 sites are no action, meaning that there's no source present, rubble piles that we determined over time that there isn't any risk there at all.

Which brings us to the last portion of this. Understanding your concerns, your comments and answer any questions that you have. This is six-year process of digging through lots of data, interviewing old employees, doing a lot of different things. It's integral to our study that we get your input. We encourage that you have oral and written comments. On the back of the proposed plan that you have in front of you, there is a sheet that you can fill out and drop in the mail to us.

The comment period ends February 10th, 1998. Once we assimilate all those comments, we create a Responsiveness Summary in the Record of Decision which finalizes the plan that we're going to go use to clean up the Naval Reactors Facility, and that will be accomplished in the summer of 1998. Finally, like I mentioned earlier, we go into the remedial design, remedial action phase that will begin in the fall of 1998.

So with that, let me turn it back over to Andy Richardson so he can field and sort out questions for you folks.

MR. RICHARDSON: You all look like you're just thoroughly engrossed here. I don't see a lot of burning questions on people's lips, but I'm sure there's some. Beatrice, you had your hand up.

AUDIENCE MEMBER: Could you explain how you decide when to do a qualitative risk assessment versus a quantitative assessment.

MR. RICHARDSON: The question was how the decision is made, whether to do what's called a qualitative risk assessment versus a quantitative risk assessment. I guess maybe a quick definition of qualitative risk assessment is one that doesn't necessarily crunch numbers down so what you have here is some number of value after some decimal point that you can use to compare to some other number. That would be a quantitative.

A qualitative is a more general process where you take a relative look as a risk manager. You make a decision on do you think that the information that you have at hand is sufficient to reasonably make a decision on a proposed course of action without going forward and doing a lot more sampling, a lot more analysis, and I guess, from my perspective, the best answer to that is, it is strictly a management decision, based on what are the uncertainties in the analysis that we have, would the additional sampling analysis and number crunching provide us any more useful information that we, as managers, see as something that might, in fact, have an impact on the decision.

So it's a fairly subjective look to a point. That's what it gets down to, management decisions on how good is the data that you have, how much more precision will add to the quality of your decision. Do you have anything you would like to add to that?

MR. OLENICK: Maybe to give you an analogy, when you do a qualitative risk assessment, it's like comparing -- when you've got numbers and you collect data -- qualitative works real well. When you collect data and you got a number like 52.9 and 59, you do a T-test or some type of statistical test to show there's either a difference or similarity between those two numbers. In a lot of instances, when you've got a number like a one hundred and one and the data is tight, you don't have to go through all that number crunching. Just say, well, qualitatively, obviously a hundred is different than one. It is a decision. It is a risk management decision, but that kind of puts it in perspective. You don't waste a lot of time going through and spending a lot of money when something is relatively obvious.

MR. ROSE: Keith Rose with EPA. I just wanted to add that the -- correct me if I'm not correct here, Andy. The Track 1 assessment is very qualitative. It doesn't involve a detailed risk assessment, whereas the Track 2 and the assessment done during the baseline risk assessment is very quantitative.

MR. RICHARDSON: That's correct.

MR. ROSE: That is a distinction in the process. Earlier on, the data is adequate. Often a decision will be made qualitatively without doing a detailed assessment, but as you get further into your assessment, Track 2 and the baseline risk assessment, it gets more quantitative.

MR. RICHARDSON: Do you have a question?

AUDIENCE MEMBER: I know that you do a lot of sampling on the groundwater. Is the modeling part of the remedial investigation or any other as far as the movement of the groundwater, and when it's going to be down to a certain level, that it's really not too seriously harmful to the human health within this 100-year scenario?

MR. RICHARDSON: The question is what's the role -- and correct me if I'm wrong. What's the role of groundwater modeling in this Remedial Investigation/Feasibility Study? What sort of modeling is done? Does it get carried in the risk assessment? Is that it?

AUDIENCE MEMBER: Yes.

MR. RICHARDSON: The answer is, yes. We do -- an integral part of the remedial investigation is the hydrogeologic study, which is a fairly detailed study of what does happen to water -- to groundwater around the Naval Reactors site and Naval Reactors Facility. We take a look at the contaminants of concern. You do, in fact, model those. You look at the different factors that affect transport. You do a fairly detailed characterization of the strata underneath the facility and how that impacts the transport of the contaminants and their potential for getting into the groundwater. In fact, the results of that groundwater modeling for the remedial investigation for the Naval Reactors Facility shows that the groundwater path is not, in fact, a pathway of concern for our contaminants. Did you want to add anything?

AUDIENCE MEMBER: So, like, within the hundred-year period then, basically -- as long as the soil is contained and capped and there's really actually no more leaching going on.

MR. OLENICK: The model did assume leaching, though. Even though there won't be any, it assumed that. So we used worst-case scenarios when we did models, but, yes.

MR. RICHARDSON: This is one point that brings up some of the conservatism. For example, with your groundwater modeling, as Bruce just said, you assume that you will get some leaching from the material, but when you do your plant uptake modeling for your ecological part of the assessment, you assume all those contaminants are still there available for the plants. So in one case you assume that it's leaching away and in the other scenario you assume that it's all there and available for uptake by plants. That goes to the conservatism of the analysis.

AUDIENCE MEMBER: I'm a little confused on the drivers cleaning this up. As I understand what you presented, you're going to move six of your sites to the remaining two larger ones and keep all of the contaminated soil on site. What has me wondering is what are the drivers that have got you to clean up those six sites? That your workers are getting exposures higher than you want, or that you're seeing that in the plant life or the animals or it's leaching to the groundwater? What's making you even move the soil at all?

What's the driver?

MR. OLENICK: Do you have a copy of the proposed plan? Let me answer that for you. His question was, what are the drivers. What is forcing us to go clean these things up? Table 2 in your proposed plan summarizes those drivers. The individual contaminants of concern and what the pathway was that triggered the response action.

AUDIENCE MEMBER: I don't understand pathway.

MR. OLENICK: What I will explain is, that say, for instance, on that table, what it says is cesium-137, food ingestion. In other words, if crops were planted a hundred years in the future on those sites --

AUDIENCE MEMBER: But you're not going to plant crops.

MR. OLENICK: But it assumes that.

AUDIENCE MEMBER: Why would you do that? Are you trying to spend my money?

MR. OLENICK: If you walk away from the site, the EPA models assume that that land is available for land use.

AUDIENCE MEMBER: You know damn well you're not going to walk away from the site.

That's a given.

MR. OLENICK: That's correct. And then you'd have no risk. The key to remember, though, is that we must model according to land use scenarios that make that land available to anyone or everyone, and so we have to use worst-case scenarios in all cases.

AUDIENCE MEMBER: That's the driver? Where does that direction come from, EPA?

MR. OLENICK: It is. All those models we looked at --

AUDIENCE MEMBER: It's a CERCLA requirement?

MR. OLENICK: It is. To evaluate all those pathways.

AUDIENCE MEMBER: I thought you could make a choice. I didn't think CERCLA drove you.

MR. OLENICK: I'll let the regulatory agencies address that. That's really what you're asking.

AUDIENCE MEMBER: I didn't know you were planting crops out there.

MS. ENGLISH: As far as the CERCLA process that we operate under, we have a set in process to evaluate risk and this process is generally standardized throughout all sites across the country. You do have some flexibility in it, as far as how you tailor the scenarios. Typically on a Superfund site, a scenario may be 30 years, a future resident who is living at the site for 30 years starting at present. On the INEEL, we did use land-use assumptions.

In general, there is a consensus among the agencies that it is reasonable to assume that the government will maintain controls over the INEEL for at least the next 100 years. That has been factored into our scenario. Therefore, those evaluation of scenarios do not start until 100 years in the future, and then the residential scenario applies to 30 years beyond that.

At this time there is no reason for the agencies to extend beyond that time. There is just too much uncertainty out there. So the answer is correct. There is a set process that needs to be maintained, but we have taken land-use assumptions into consideration, and we have adjusted the pathways and scenarios that we're looking at to include that potential future land use.

AUDIENCE MEMBER: Let me understand this. Then are you saying that you clean those six areas up and you cap this over in your other two areas, and after a hundred years, then you could go grow crops in those leaching areas or whatever you call them? Is that what you're saying? Because that's what I heard.

MR. HUTCHISON: What that's assuming is that in those six areas, you're right. We can go -- in 100 years, establish a residence and go farm there. The landfill covers are going to have institutional controls. They'll have deed restrictions, some sort of --

AUDIENCE MEMBER: So the EPA is telling me that it would be okay for me, in a hundred years, to build a home there within several hundred yards of that cap?

MR. HUTCHISON: That is right.

MR. ROSE: I want to reemphasize that this is a hypothetical scenario. The most likely use of INEEL for the next 100 years is government controlled activities, maybe limited industrial use, but we're required under CERCLA to look at potential future hypothetical residential scenarios, as well as the industrial, and then we have flexibility to pick among the various scenarios looked at and determine which one will drive the cleanup. In this particular case, this site, it's the future residential scenario which drives the risk. In other words, drives it to a lower level. It is a slightly lower level than current industrial use. So the intent is to clean up for that lower standard.

So if, in 100 years from now, there is some residential use, there won't be any residential use in the capped areas for the preferred alternative, that will always be restricted. No one will build houses or grow crops there, but in the adjacent areas around it, if someone comes along and it is permitted to build residences there, they would be protected under this action.

AUDIENCE MEMBER: If you made the assumption that NRF would be a testing station for the rest of time -- I don't know what the rest of time is in EPA terms -- would you clean it up? Is there any risk associated with it? Is that a no?

MR. OLENICK: Let's assume that if it were a Naval Reactor Facility for 500 years and a controlled government access, we would look at the levels of contaminants there, which are primarily the radionuclides, cesium and strontium, we would look at those concentrations, look at how they would decay over time. If after 500 years that stuff was below levels of concern, we might take a different action. It may go with just controls, control access to the site and no capping required if that were the case. But I think as you heard, there is no assurance that the government will be there after a hundred years from now.

AUDIENCE MEMBER: Other studies -- in other studies that you've done, the contamination levels for the level of contamination that you began to be interested in was in nanocuries. What is this PCI, is this picocuries?

MR. RICHARDSON: The question is a question of the terms of the measurement that we used. PCI is picocurie, is one trillionth of a curie. A nanocurie would be one 100 hundred millionth of a curie. So this is 1,000 times less than a nanocurie essentially. So they are very small numbers.

AUDIENCE MEMBER: The reason why this became a CERCLA site is because certain levels were exceeded as far as the groundwater and the basalt contamination and those other things?

MR. RICHARDSON: Actually, when you look

at the history of the Naval Reactors Facility, if the Naval Reactors Facility had been out there all by itself not surrounded by the rest of the INEEL, the levels of contamination there frankly would not have been of enough concern to place the Naval Reactors Facility on the national priorities list to make it a Superfund site. The contamination levels would not have been bad enough to get us listed, but since the INEEL has a number of facilities and it is considered one single federal site, we were included as part of the overall Superfund cleanup for the INEEL. Does that answer your question?

AUDIENCE MEMBER: You're saying that NRF really doesn't have that bad of a contamination problem as far as groundwater and soil?

MR. RICHARDSON: Yes. There are some problems. There are things we think we need to go clean up, but comparatively, particularly in relation to some of the other facilities at the INEEL, contamination levels, frankly, are pretty low. It doesn't mean that we don't think we need to go do some work. It's just on a relative scale they are low. Beatrice.

AUDIENCE MEMBER: I think I understood

Mark to say that you were going to be monitoring for 30 years?

MR. RICHARDSON: The question was -- to make sure that the assumption, preferred alternative that we would monitor -- the question is, with the assumption as far as monitoring, it is the institutional controls over the long term. The monitoring for the different alternatives, particularly the cost that assumes 30 years' cost for monitoring the institutional controls are, in fact, assumed to be in place for a hundred years. Those are for comparison purposes. Frankly, that doesn't mean that after 30 years we're just going to quite monitoring. But for the purposes of the study and to meet the scenarios and put them all on an even playing field, those are the assumptions we used for the model.

AUDIENCE MEMBER: In the government's agreement there was a 40 million earmark for (indiscernible).

MR. RICHARDSON: The question is, are the funds that were earmarked in the governor's settlement agreement towards -- the word you used was optional. I don't think it's quite the word, but it has the same intent. Are those funds applied towards some of this work? In fact, some of those funds, in fact, may be applied to this. Most of those funds are applied towards other remedial -- I won't call it remedial action -- other cleanup actions that are not necessarily CERCLA based. The things that, as a program meeting, our own standards we feel we need to go do. Discretionary, I think is the term in the settlement. Are there any other questions?

AUDIENCE MEMBER: You mentioned monitoring a few times. What kind of a monitoring program do you envision?

MR. RICHARDSON: The question is what sort of monitoring program do we envision. As Mark spoke earlier, we have -- remembering that this is the north groundwater on the INEEL flows across NRF essentially from the north to the south. We have an entire system of groundwater monitoring wells, six new ones that were placed about two years ago along with some U.S. Geologic Survey wells that monitor primarily on the down-gradient side, but we also have up-gradient wells that we can use for comparison. So we have wells all around the place. So we do quarterly groundwater monitoring. We also have in place and have had in place since the 1960s additional environmental monitoring. We go out, we take soil samples. We take vegetation samples, particularly in places that we thought had the potential for contamination. So it's a comprehensive monitoring program with an emphasis, frankly, on the groundwater.

AUDIENCE MEMBER: After you see it in the groundwater, what would be the response?

MR. RICHARDSON: If, in fact, you saw contamination in the groundwater, at that point -- that gets back to the five-year review that we discussed earlier, making sure that the actions we are taking remain protective. If, in fact, we saw a change in contamination levels in the groundwater, we get back with the EPA, we get back with the state, we make a determination on is there some anomaly. Do we think that, in fact, our remedy isn't as protective as we thought it was going to be, and how do we need to change that remedy to make sure that it is protective. So it would be a collaborative decision, again, between the three agencies. I'm sure that there would be public involvement in that process also, but there's a five-year review process to make sure everybody is, in fact, happy with the way the system is performing.

MR. OLENICK: If I could add to that, also the data is submitted to the state and EPA after each quarterly monitoring period. So it's actually shared with the regulatory agencies and they continually look at that data as time goes on to ensure that those actions remain protective. That's how we do it now. Based on the preferred alternative that isn't selected yet, we will either add or tweak that program, depending on what the selection is.

MR. RICHARDSON: Are there any other questions?

AUDIENCE MEMBER: Do you perform any monitoring in the vadose zone to give you an earlier indication of possible contaminants rather than waiting for it to get all the way to the groundwater?

MR. RICHARDSON: The question is do we do any monitoring in the vadose zone, which is the unsaturated zone between the land surface and the aquifer which, at NRF, is about 370 feet below grade.

MR. OLENICK: We did. We monitored -- I forget. I think we had 80-something perched water wells. I forget how much we had sprinkled all over the facility. The areas we're talking about have no more perched water underneath them. That has long since dissipated and dried up, so the only water source that we've really got is the aquifer itself. Since there's no driving head, there's really no need to go off and keep looking for water underneath those when there is none present, but we have in the past.

MS. ENGLISH: I just wanted to emphasize that since this is not a selected remedy, we have not developed a monitoring program yet, so if the consolidation and capping approach, as it becomes the selected remedy, then the agencies will get together and determine a monitoring strategy of frequency, duration type of monitoring that best meets the needs to demonstrate continued protectiveness of the remedy. That could. Right now, it hasn't been including vadose zone monitoring, but it could. We have looked at the vadose zone for other remedies on the INEEL, including some landfills at NRF that were part of a previous remedial action. But to state just what exactly the monitoring will be at this time is a little premature, because we're just trying to determine what the remedy will be.

MR. RICHARDSON: Are there any other questions?

AUDIENCE MEMBER: I was wondering, plants (indiscernible)?

MR. RICHARDSON: I think the question had to do with use of plants to remove contamination from the soil. That's for -- that goes to the next presentation which is for the Argonne National Laboratory-West. We at the Naval Reactors Facility don't have any current plans to start dry farming out there, or wet farming for that matter.

AUDIENCE MEMBER: You mentioned two possible options for the NRF facility in the future. One, you said it might be through the purview of the government. You also mentioned it might be converted to agricultural use. Have you considered making it -- trying to restore the native vegetation that was here when Captain Rickover came through and putting buffalo that was there a hundred years ago and make it more of a nature preserve?

MR. RICHARDSON: The question goes to future plans or potential plans for land use at the

Naval Reactors Facility. As discussed earlier, our plans look at residential scenarios primarily. The question is, what about maybe turning it back to a more native state similar to a hundred years ago or so. From the standpoint of the assumptions that we had used in the analysis, no. We looked at the residential scenario. We looked at the worker scenario for the modeling. Now, does that necessarily preclude some of those -- returning it to a natural state? Not necessarily. Let me ask Bruce Olenick to speak to that also.

MR. OLENICK: Your question is, did we take a look at the impacts on native vegetation as well as plant and animal species -- or animal species, and you've got to keep in mind here -- and you'll hear Argonne a little bit later -- the primary difference between NRF and Argonne contamination problems is that NRF's contamination problems are basically 10 feet below ground, eliminating that pathway. That cover is to ensure that there is no integration of animal species to come in contact with that contamination.

Argonne, on the other hand, their concerns are more spread on the surface where they do have ecological risk. So, again, our drivers were human health, of something, digging a house and building a foundation in that. Whereas from an animal perspective, there is no pathway for them to get at that. So we did consider that in a hundred years from now raising -- in those areas of these six sites, if we were to clean them up and cap, it would be acceptable to those animals.

AUDIENCE MEMBER: My question is more direct. Why don't we restore it and make it a wildlife preserve as opposed to something that should be considered when you do these. For instance, I don't know what kind of footprints the buffalo might make in your cap. If you had enough buffalo, you would have some kind of a dent in it.

MR. OLENICK: Remember the caps are going to be designed to prevent animal intrusion there. Again, that was a representative cap. If that is a selected alternative, the federal research that goes into the development of those caps are to have huge boulders. I think SL1 uses a similar capping scenario to keep animals off those areas. So that is considered, though.

MR. RICHARDSON: Beatrice, I think that you were next.

AUDIENCE MEMBER: My understanding is

that the land use assumption has been discussed and gone out in draft form and had public comment, and I think at some point the agencies just have to make some assumption, based on public comments and advice, on what the land use is going to be so that you can go ahead and do some planning based on that. But I think in the long term, there will be a continuing discussion that we should all take part in about what happens next.

MR. RICHARDSON: Part of the question of whether or not you return this to a natural environment has to do with the process when you actually tear down the buildings. At NRF, at least, some of the buildings are currently in use. Beatrice said there really is -- has been an ongoing dialogue and perhaps needs to perhaps come to some better focus on what the long-term land use planning really is for INEEL. But when the time comes to make the decision on what -- or any of the other facilities out there, is there a process under the National Environmental Policy Act that also goes through the same sort of evaluating process at public hearings and input, and it's at that point where that kind of decision gets made rather than this rather narrow one here. I would like to say that at other places where the Naval Reactors program operates that we have shut down, our general intent is to allow it to be returned to any use including return to native species.

AUDIENCE MEMBER: In your waste streams that have been percolated in your pits at S1W and so forth, have there been any steps to remedialize the types of waste and how they may affect water? In other words, the solubility of the waste. I notice that cesium and strontium are both either alkaline or alkaline earth metals. They absorb into water. As metals they oxidize easily. Have you taken any remedial steps as far as the chemical content of these waste streams?

MR. RICHARDSON: The question that -- if you didn't hear it, to make sure I understand it, it was, have we taken any sort of steps in the contamination that is currently in the soil to either reduce the mobility of the contaminants that are already there? That seemed to be the thrust of the question.

AUDIENCE MEMBER: I'm concerned with seepage into water tables. If the solubility is such that water dissolves it and it goes away, particularly into the aquifer, is there any remediation steps that you've taken to keep it out of the air or water?

MR. RICHARDSON: I guess the -- if I can use the term -- and I'll probably be corrected if I use it incorrectly -- it sounds like, have we considered some sort of treatment of the material that's in the soil prior to initiating the remedial action that we're planning? The answer to that really is, no. One of the reasons for that, frankly, is when we've done the sampling primarily in the areas of the leaching pit, leaching beds, what we have found, by and large, is that the vast majority of that contamination is already bound fairly securely in that soil.

When we sample, we went from the surface all the way down to the basalt, which on the average is about 30 feet below ground level at the Naval Reactors Facility, and we would normally take samples in every two to four feet. We would pay particular attention at the level that those discharge pipes were at. What we found was the bulk of the contamination has stayed from about the discharged level to three or four feet below that because of the soil type that was in those pits, and, in fact, it does not appear that those contaminants at this point, particularly leaching beds, are migrating down. So again, you have the balancing act of do you go off and try to do some sort of treatment to stabilize it but, in fact, destabilize it while you're trying to do the treatment when the evidence shows that right now it's pretty immobile. Again, those are the risk management decisions that are taken into account.

MR. OLENICK: I also wanted to mention that -- and you bring up a very good point. We did look at all that. The modeling we did -- also we made some pretty big assumptions. I'm assuming that cesium is again placed in a soluble form and made available to travel through the soil. That's a big assumption first. And then we also assumed maximum rainfall and flood conditions to assume that we had a driving head to force that down in our modeling, and so with all those conservative estimates throughout that modeling process, we did not model any detection in the groundwater. So we did assume that because the contamination levels are low and because of where it's found in the soil there, the answer to your question, yes, we did do that, but we didn't feel it was necessary.

AUDIENCE MEMBER: Related to that, did

you look at the daughter products, cesium decays to something -- are the daughter products -- have the same insolubility, or somewhere down the chain could it become soluble and have a daughter product that also might be somewhat of a risk driver?

MR. RICHARDSON: The short answer is, yes.

AUDIENCE MEMBER: That's a good enough answer.

MR. RICHARDSON: Are there any other questions?

AUDIENCE MEMBER: That is a pretty picture, that engineered cutout. How far along is that?

MR. OLENICK: That was a hypothetical cap. We have a whole resource of information technology to go off and use if that's the selected alternative. That was to give you an example of the types of things we're thinking about. All that information will be assimilated and evaluated if that alternative is selected. We either will enlarge the sizes and the thickness of the individual layers. Permeability is considered. So all that is evaluated in the RDRA, the remedial design, remedial action phase that begins next fall.

AUDIENCE MEMBER: You don't have the contract yet?

MR. OLENICK: That's correct.

MR. RICHARDSON: We need to, in fact, select a remedy, then the next step which we anticipate performing next summer is getting into the actual hard engineering design of, if, in fact, we choose covers, now we get into the good, hard engineering of what design cover do we want to use. Are there any other questions?

MR. SIMPSON: Who does not have a copy of this proposed plan but would like one? If I can see a show of hands. One person. We'll get you a copy. We're at the portion of the meeting where you can comment for the record. As I mentioned earlier, we have a court reporter present who will be recording your comments verbatim. I should also mention that you can comment using the comment forms in the back of the proposed plan, or we can get a tape recorder and record you if don't want to make comment in front of everyone.

AUDIENCE MEMBER: The written comments are also part of the record?

MR. SIMPSON: Correct. I should mention

that when you do comment, please clearly speak your name and give your mailing address so that when the agencies respond to your comment in the Responsiveness Summary of the Record of Decision, we can send you that document. Can I get a show of hands who is interested in commenting for the record. I'm going to bring the microphone around to help out of the court reporter.

PUBLIC COMMENT

AUDIENCE MEMBER: I'm just submitting a written comment.

AUDIENCE MEMBER: I'm concerned about the proposed engineering design. My name is Buck Sisson. I live in Idaho Falls. My home address is 6047 West 17 South, 83402. I'm concerned about the proposed engineered burial over the top. It has a tendency -- it will maximize infiltration, probably collect snow and a lot of infiltration that is going on, really accelerating migration that should take place. I think that would be -- I'm worried about the engineered burial that is going to maximize infiltration and it will trap snow, and there won't be any plants growing, so it will maximize the infiltration and the leaching of the soluble waste.

There are much better alternatives than that. DOE spent quite a bit of money on developing cap or barrier designs that minimize that leaching effect, and it should be seriously considered. Also the monitoring system should be in place in the vadose zone so you get an early warning if anything goes haywire. You'd have plenty of time to make remedies and fix it.

MR. SIMPSON: Thanks. Anyone else?

AUDIENCE MEMBER: My name is Joe Merted. My address is 496 South Pendlebury Lane, Blackfoot, Idaho. I would like to see a sharing of the technologies and the study data and the other ways that they have used to make decisions, and I'd like to see the modeling made available so that we can understand weather and understand groundwater phenomena and also deep water phenomena at the site and also in our areas. I've noticed in the previous studies that they've used models for weather forecasting that weren't based on our particular area. I would like to see a dynamic model of the Snake River Valley developed. I think it would help not only the site but agriculture and all this. These are probably some of the spin-offs that could happen from this wonderful science that we're seeing, and I would like to see more of that happen.

MR. SIMPSON: Thank you. Any more comments? I would like to remind people that the comment period remains open on this project, and then also the next one that we're going to be discussing until February 10th. At this time I would like to take about a five-minute break and come back and we'll discuss the Argonne National Laboratory-West Comprehensive Investigation.

(Break.)

MR. SIMPSON: At this time I would like to introduce the agency counterparts for the Argonne National Laboratory-West Comprehensive Remedial Investigation/Feasibility Study. Representing the state of Idaho, Division of Environmental Quality is Daryl Koch. And once again, Keith Rose is representing the Environmental Protection Agency, and they are both going to make a few statements about this investigation.

MR. KOCH: Good evening. We seem to have lost our audience. I just shortly came on to this project from my predecessor at the DEQ, but he did a very good job as well as the other agency representatives. I would like you to know this project is about one year ahead of schedule, one year ahead of milestone schedule. There's some minor upsets along the way, but that does happen with paperwork that we handle a lot of. So I want to applaud my counterparts for bringing it along so quickly.

In the WAG 8 demonstration earlier on NRF, Rick Nieslanik, when we opened up the presentation, talked about the similarities and differences you might see between the two projects. I just want to emphasize that a little, and sort of set a framework for you of the site as to why we came up with the preferred remedy. It's not been selected yet, but guess I'm trying to do a sales job here tonight on why we think it's the best alternative for remedial action.

Now, if you look at the overhead view of Argonne National Laboratory-West -- I'll just call it Argonne for tonight's purposes -- as well as with NRF WAG 8 before, both of these sites are in what we call an arid site. You wouldn't say that walking outside tonight, but this is obviously -- this is an arid desert climate, eastern Idaho. So ignore the snow. During the summer it gets very hot here, a lot of wind. Everything evaporates quite readily. I think we're under 10 inches per year of annual precipitation. That is considered a desert ecosystem. You've seen the kind of plants and animals we have out there, sagebrush. It doesn't need a lot of water. Grasses, certain kinds of grasses, et cetera.

So basically, as I said, I want to lead you into sort of the type of remediation we've selected, preferred remedy, and set the stage here. Obviously it looks very dry, doesn't it. As you see, though, there is water, sewage lagoons. There's an industrial waste pond. And feeding this particular industrial waste pond are several ditches, identified Ditch A, B and C, interceptor canal, et cetera, to our blowdown ditch, industrial waste lift station discharge ditch, and in -- for past practices, which is really what CERCLA looks at, looks at past practices when they're -- basically, the kind of regulations we have today we look at potential releases from those sites and actual releases, and that's what you'll hear from the Argonne representatives after me talking about what they look for, what they found, what their risks were, why we're doing a preferred remedy cleanup and the risk assessment process they went through.

I just want you to focus, if you can, though, on this overhead. What we have is a dry site, but we've added water. When you add water to the desert, things grow. In this particular case, you can't see it from the overhead, but in these ditches, et cetera, what Argonne has created by use of groundwater from 300 and some feet below the surface is a mini-ecosystem. As you drive down the highway when there is water in the ditches, you will see often cattails and reeds and other grasses. You'll see blackbirds, red wing blackbirds. You see all sorts of species.

Well, the same things happened down here. You add water and miraculously seeds get there. Birds bring seeds in and other animals and things grow. They just don't normally grow in the desert. Cattails don't grow out where sagebrush usually is. But in this case it does. So with these intermittent discharge streams -- and they are intermittent still. There is flow in these ditches. It's -- a typical little ditch would be maybe five or six feet across, a few inches deep of water flowing through it.

But along this ditch is an ecosystem. It's quite novel out there. I saw a beautiful yellow bird when I was out there a few months ago. I've never see that kind of yellow bird. I don't know what it was. Obviously it was attracted to this type of environment. There's bugs for it to eat. There's all sorts of goodies going on out there. So what this has created is a mini-ecosystem. So as you hear their presentations and risk assessment performed on these ditches for the contaminants of these previous releases, then you'll see we had discharge of heavy metals. We've had some discharge of radionuclides. Again, they'll talk about that more in detail.

I just want you to focus on the system we have selected as preferred remedy which is phytoremediation, a long fancy word for plants doing what they normally do and uptaking metals, nutrients. They sometimes don't know the difference. That's a good aspect of what we're selecting because they take up the -- we'll call them the contaminants of concern here, radionuclides and other heavy metals that they don't normally take up because they're not normally in a regular ditch by the side of the road. But again, due to these past releases, they are there now.

So this novel approach, which we, as the state, are really emphasizing, we are very aggressive on saying we would like you to consider this alternative is that the plants themselves that are in the ditches, we already know they are uptaking some of these metals. Like I say, they really can't help it to some degree. But Argonne wants to go to off, and they are doing the feasibility study now actually, back at Argonne East in Chicago, to look at other plants native and maybe non-native with low impact to the environment. That could be other types of plants. It could even be young sapling trees which will really suck up water, and you'll hear about those different kind of species.

So I just want you to concentrate, hear all the technical presentation. The state of Idaho is looking at kind of a simple thing here. These are high tech reactors. You will hear about the processes that went on, very fancy reactors and that we're looking for a solution that is Mother Nature's way of cleaning up the environment and trying to protect the ecosystem ANL-West has itself created which will be there for probably several more decades because there will be some intermittent flow in these ditches. So I just want you to take a look at that and see if you agree with the selected remedy we have selected. Thank you.

MR. ROSE: Good evening again. I'm Keith Rose. I'm also EPA's remedial project manager for the Argonne Lab-West site as well as the NRF site. And the comments I made previously on the NRF site also apply to Argonne. EPA has reviewed and approved the Remedial Investigation and Feasibility Study for the Argonne Lab, and we have reviewed and concurred on the proposed plan including the preferred alternative which is phytoremediation which you're going to hear about tonight. Of course, this preferred alternative is based on seven of the nine criteria which I discussed earlier.

The two remaining criteria which are very important are state acceptance and community acceptance, which this meeting is part, and the public comment period and the proposed plan is part of gathering public comment on the preferred alternative and proposed plan. I would like to say, though, that the preferred alternative which is part of remediation is an innovative technology. It has the potential for cost-effectively sequestering or taking up the contaminants of concern and removing them from the environment. So we're very interested in the outcome of this -- of this technology. As you'll hear later, there's been some bench scale tests we've conducted prior to the Record of Decision to see whether it, in fact, has the potential to work. I will leave that to Scott Lee to tell you more about that. Thank you.

MR. SIMPSON: At this time I would like to introduce Greg Bass. Greg is with the DOE-Chicago operations office which manages Argonne National Laboratory-West. He's going to talk about the facility background and a little bit about this investigation.

MR. BASS: Thanks for coming out tonight. As advertised, I am Greg Bass. I am the DOE Waste Area Group 9 manager and have been since 1991 when the Federal Facility Agreement for the cleanup of the INEEL was signed. I am the third leg of the three agency approval process for this

Reactor, another research reactor. And the only reactor that is still operating of the five and fueled is a neutron radiography reactor in the basement of this Hot Fuel Examination Facility that we still use to look at fuel samples.

Over the years, Argonne has had a variety of missions with national and international sponsors. Mainly since 1958, Argonne has done research on developing reactors that can shut themselves down safely and reactors that can recycle their spent nuclear fuel all in the same facility, meaning that spent fuel will be taken out, reformulated, and the fuel and its long-lived actinides, we call them, such as plutonium, would be put back in the reactor and burnt up while generating heat.

Some of our modern missions since 1990: We have done WIPP waste characterization. WIPP means Waste Isolation Pilot Plant. It's a facility down in Carlsbad. There's a lot of waste on the INEEL that is destined for that facility, but it can't go until a certain amount of that waste is actually visually verified to be what it says it is. We do that at Argonne and are continuing to do that. Our core mission right now is spent fuel proposed plan, and briefly I'm going to go over a little bit about the past mission of Argonne National Laboratory and where we think some of this contamination of our ditches and pond bottoms might have come from. Once I tell you what the problem is, I'll get Scott Lee up here who works for the University of Chicago at Argonne National Laboratory-West to go through the remedial investigation process with you and how we narrowed our 39 sites down to the 5 that I'll show you in just a minute.

Just real quick, this is not a group of UFOs. This is Argonne National Laboratory-West where I work and have worked long and hard. Briefly, some of the major facilities, the Transient Reactor Test Facility is out here. It was used for many years to test nuclear fuels under extreme conditions of heat. Experimental Breeder Reactor-II is a liquid metal reactor. It was shut down in 1994 and has been defueled. The Zero Power Physics Reactor is this white one that looks like a spaceship. It was used to mock up reactor cores for much larger reactors over the years and has been shut down since '92. There's a small reactor inside this complex called the Advance Fast Source stabilization research and development. Primarily that means we take spent nuclear fuel that has a constituent that is reactive in the environment such as sodium, and through an electrometallurgical process, we separate that spent nuclear fuel into waste forms that we think are disposable in a geologic repository. It's very important research, and we are working very hard on it right now.

Just briefly -- this is the same slide Daryl was talking to. Over the long history of Argonne National Laboratory-West we've looked at an awful lot of fuel samples and done a lot of radiochemistry. That's the field of chemistry that studies radioisotopes. A lot of those fuel samples had to be dissolved and a lot of the liquid from that dissolution process, as well as just washing laboratory equipment, was formerly, in the '60s discharged into a sewer system which terminated in a leach pit called the EBR-II leach pit. EBR-II Leach Pit was simply a rock-bottomed septic tank, very simple method of disposing radionuclides and it's a method we don't do anymore.

The leach pit is about 15 by 40 feet. You could probably park a medium-sized Winnebago in it. The EBR-II leach pit is no more. In 1993, knowing that the sludge in the bottom of the leach pit and the piping leading to the leach pit were contaminated, we went ahead and removed that facility. We took the sludge out of the bottom. We demolished the concrete lid and walls of the pit and we took the piping out of the ground in this area, and filled the entire area with clean soil. So the leach pit is no more.

However, during its operation, it had an overflow pipe that went to this interceptor canal. This canal was constructed along the western side of Argonne-West to divert natural storm water flows around the Argonne site into this industrial waste pond, which is sort of a low spot on the site. The radionuclides that were in the leach pit overflowed on one or two occasions into this interceptor canal and storm water came along and carried the contaminants throughout the length of the canal and deposited some more into the bottom sludges of the industrial waste pond here.

This mound is just dredged material that was taken out of the interceptor canal after it was discovered to be contaminated. The mound is also contaminated with cesium-137. The notable thing about the industrial waste pond, the mound and the interceptor canal is those are the only sites that posed an unacceptable human health risk of all these sites you see at Argonne-West. We looked at a total of 39 sites, and out of these, only five sites posed either a risk to human health or a risk to the environment and some posed a risk to both. You can count more than five sites here. There's nine labeled. These nine -- those five sites were split in some cases to make our analysis of the fate and transport of their contaminants simpler.

But this is the list. This is all the facilities that we find unacceptable contamination in at the present time. By unacceptable, I mean higher than the national standard or higher than a standard that would allow us to release it to any use, human or animal or plant or otherwise, for the future. Briefly, these ditches you see in here, Ditch C, the main cooling tower blowdown ditch, and Ditch A and Ditch B are primarily contaminated with heavy metal constituents that were used as corrosion inhibitors and slimicides and algaecides in industrial water uses such as cooling towers.

We ceased using things like chromates in the cooling tower water in 1980. The industrial waste lift station discharge ditch has some photographic type chemicals that were discharged to it in the past, and those constituents remain in the sediments at the bottom of the ditch. It's important to note that all the contamination I'm talking about is very shallow. It's typically between zero and three feet below the bottom of these ditches, and therefore it's rather easy to get at should you want to go after this contamination.

Without stealing his thunder, I'll let Scott go through the remedial investigation process now, how we whittled our 39 sites down to this group, and also he'll describe to you the alternatives for doing something about this contamination that we explored, and he will go in some detail on a rather unique preferred alternative which is the use of phytoremediation, which is actually using a farmed plant in these ditch bottoms to uptake the contaminants of concern.

So I want to tell you a little bit about Scott first. Scott works for the University of Chicago, and the University of Chicago operates Argonne National Laboratory-West for the Department of Energy. Scott has been involved with this remedial investigation process for over three years since it began and has worked long and hard on it. He is the authority on the Remedial Investigation/Feasibility Study report as well as the proposed plan. With that, Scott, take it away.

MR. LEE: Thanks, Greg. As Greg mentioned, at the Argonne National Laboratory we have investigated 37 WAG 9 sites. To evaluate those and do a good job evaluating those, we have broken those 37 sites down into 43 distinct units. That means separating an industrial waste pond from a ditch. They have different exposure parameters, different driving forces, in this particular case, water. In addition to that, this is a Comprehensive Remedial Investigation/Feasibility Study, and we included two sites located close to the Argonne facility. These are in WAG 10 as Rick has mentioned earlier. They are a closer facility.

One of those is a wind-blown contamination investigation. The second is a stockpile soil that is actually the dredged material from the interceptor canal. That was moved a short distance down the road. So we included those in our Comprehensive RI/FS. Once again, the Comprehensive RI/FS evaluates how the risks in one site are related to the risks in another site. We have animals that cross over and use multiple sites, and so by individually looking at the risk in one site, you're not grasping the whole picture.

To complete the Comprehensive Remedial Investigation/Feasibility Study we have collected over 9,400 contaminant specific samples, and this is a summary of those results. As you can see on the left side of this chart we have started off with the investigations of the Track 1 and Track 2. Greg mentioned we have gone into and conducted a removal action at the EBR-II leach pit and all the other Track 1s and Track 2s were determined to be no further action. We again took all those sites to make sure we haven't missed any contaminants, to make sure we have assessed all the exposure parameters and pathways and incorporated those into our Comprehensive Remedial Investigation/Feasibility Study.

We have completed that and we have selected a preferred alternative, and we're now at this phase right here prior to going into the

Record of Decision where we're soliciting your input to make sure prior to the selection of the selected alternative. After that we will go into the remedial design, remedial action, continued monitoring and some sites will drop off as no further action.

This is just an overview of the exposure pathways at the Argonne National Lab which are similar to those evaluated by the Naval Reactors Facility. We have an occupational scenario. We have a current occupational scenario for a worker on site right now, working there for 25 years. We have a future occupational scenario that we evaluated, which is an individual starting 30 years from now and working for the next 25 years. We have assessed a residential scenario, which is an individual living at the site a hundred years from now and will continue living there for 30 years. And those are the pathways we evaluated: ingestion, inhalation, direct radiation exposure and dermal contact.

In addition to those, we have included groundwater ingestion, ingestion of homegrown produce and inhalation of inorganics in our case, for a future residential scenario. Those are not assessed for the occupational since the current occupational and the future occupational do not drink as much water. We do not shower out there as often as a future resident would.

And based on this whole risk assessment process, we found that we only had one contaminant. That is cesium-137 that poses an unacceptable risk for the human health scenarios. I'll show you where those are. For the present day this is the occupational scenario. We have the three sites Greg pointed out, the industrial waste pond, the interceptor canal and the interceptor canal mound that pose unacceptable risks currently today. This is one in 10,000 risk level and you see were greater than that for all three of these sites. We have 37 sites that have risks below the threshold of one in 10,000 for human health, and we've eliminated those.

The contaminant, again, is cesium-137, a relatively short-lived radionuclide with a half-life of 30 years, and we have the actual radionuclide concentrations listed below. We have 29.2 picocuries per gram, 18 picocuries per gram and 30.53 picocuries per gram, and remember every 30 years these decrease by one-half. The actual threshold criteria, this threshold line for the cesium-137 current occupational scenario is -- I want to say 16.7 picocuries per gram, so we do not have a very large delta right there as you can see.

I'll go on. We decayed those just to give you an idea of what those concentrations would be in the future. A hundred years from now the cesium-137 in the industrial waste pond would be 2.83 picocuries per gram; interceptor canal, 1.75; and the interceptor canal mound, basically, 3 picocuries per gram. You can see the interceptor canal itself. The risk is now below the one in 10,000 through natural decay without doing anything. This one in 10,000 risk line is set at that time to be 2.2 picocuries per gram so these two remaining sites a hundred years from now are just slightly over for the cesium-137.

And again, just in summary you can see these three sites were all related to the same inadvertent release that flowed to the Interceptor Canal and to the industrial waste pond, and, again, this mound area is the stockpile of the dredge materials. We've also assessed the risk to the ecological receptors. This includes flora and fauna, and we have determined, based on an individual animal receptor, not a population of animals, but on an individual basis, we have 12 inorganics that pose potential risks to these individual animals.

This is a chart showing the hazard quotients and where each of these individual sites are as compared to what we're using for cleanup of a hazard quotient of 10. You can see we have hundreds and up to 10,000. Now, I have to put a caveat on here. A risk of 10 versus a risk of 100 for a hazard quotient doesn't mean it's 10 times more hazardous to the ecological receptors. Remember back to Rick's diagram on hazard quotients. We have a -- it's a nonlinear function, and we have the observable effect, and we use in risk assessment a concentration lower than that, and so these -- we do not have what would appear to be a major problem on these ecological receptors.

Again, we have the sites shown on the map. Ditch A, Ditch B, Ditch C. We have two of the three sites with the human health risk have potential for eco risk which makes sense intuitively. We have the sewage lagoons, the industrial waste lift station discharge ditch and the main cooling tower blowdown ditch. As Greg mentioned before -- or he didn't mention, the sewage lagoons we are currently using, and will continue to use these sewage lagoons for the useful life of the Argonne Facility, even though they appear to pose potential risks to the ecological receptors.

The reason for that is the exposure pathway for the unacceptable ecological receptor is a small burrowing mammal. This is a mouse burrowing in there, and as long as we have the water there, which typically is eight feet of water, there is no exposure pathway. And the same is said for the industrial waste pond, which currently has water and will have water until the year 2001. Once that site dries up, then we would start our remedial action on that to eliminate the exposure pathway to a small burrowing mammal.

As Daryl mentioned, the depth to groundwater is 365 feet. In our case at Argonne, I think he had the numbers mixed up. It's 635 feet to groundwater. Greg Bass mentioned that our contaminants are found within the top three feet of soil. Almost exclusively, contaminants are in the top foot of soil. We have very few contaminants deeper than one foot and only a few of those extend past two feet on a very limited basis.

Basically, I've just gone through what our risks are, what these contaminants are and where those sites are located, and now I'm going to basically establish what we have gone through, how we're going to protect the human health and environment. We have established for human health, to use the NCP guidance of one in 10,000 as our criteria of cleanup and for the ecological receptors on a population basis, we're using a hazard quotient of 10 for our cleanup standards. We have evaluated 28 different alternatives for cleaning up these areas. We screened that list based on costs, implementability and a couple of other factors to a list of five alternatives which could be applicable at the Argonne National Lab Facility.

The first one is no action. The second is limited action. The third is containment in institutional controls on site at the Argonne Facility. The fourth is excavation and disposal, removal of those contaminants and sending them to either an on-site or off-site disposal, capping. The fifth is phytoremediation which involves utilizing plants to extract these contaminants. Shown on the right side of this chart are the nine evaluation criteria. The first is protection of human health and the environment, and the second is complying with applicable laws. Those are the threshold criteria.

For any of these alternatives to be implemented, we have to at least be protective of these first two threshold criteria. If we do not protect human health and the environment or do not comply with all applicable laws, those are screened off. Based on those two criteria, no action, continue to do no action, does not meet the criteria, so we eliminated no action. We've eliminated limited action which involves just putting a fence around and watching, and we've eliminated one alternative. It's Alternative 3b, if I remember correctly, which is a native soil cover because the animals could potentially get through there.

The middle five criteria are what are called the balancing criteria. This is where we evaluate the retained alternatives with against each other based on those criteria. I will go in and show you the table and how we ranked each those all alternatives against either other. And these last two criteria, we're here tonight to get your input on, making the decision for these last two evaluation criteria.

Once again, Alternative 3 is capping the contaminants in place. Limiting the migration of contaminants from the site. Isolating the contaminants and instituting institutional controls, fencing, deed restrictions to limit the potential exposure to a receptor. In addition, that would involve using air, ground and soil monitoring to make sure none of these contaminants are migrating from the facility or the containment facility.

Alternative 4 that we evaluated, we evaluated an Alternative 4a which looked at using a currently existing INEEL facility otherwise known as RWMC or potentially an INEEL soils repository which is yet to be built, and you will hear about that in the next couple months. It would involve removing the contaminants from the Argonne site, hauling them down to this on the INEEL location, and they would be placed in a cap at that location. The off-site would involve the same process for moving those contaminated soils to a railhead and then transporting them to a private facility, most likely in Utah.

Alternative 5 is phytoremediation which is using plants to extract these contaminants from the soil using their natural ability. These plants have been around for millions of years, and they've adapted to various conditions and contaminant levels around the United States. It's natural for a plant to extract what it needs. The phytoremediation takes this one step further and selects the plant to put in there to remove your specific contaminant. The plant matter would be harvested, dried, baled and then sent off site to an incinerator. Comparing this with the other alternatives, obviously, if you're not moving the soil, you're removing plants. You've reduced the volume of material that you're moving to less than 1 percent.

Then after the plant matter is at an incinerator, once that is burned, your volume of material is reduced considerably from that level. We're currently scheduled to use an INEEL incinerator for the disposal of our plant matter. As I said before, this is a chart comparing the alternatives that were retained against each other. We have Alternative 3 which is containment on site. Alternative 4a, which is containment on the INEEL. Alternative 4b, which is containment off the INEEL. And we have Alternative 5 up here. These are ranked by the evaluation criteria against each other.

As can you see, we had to comply with all applicable laws, and we had to be protective of human health, so all of the criteria are ranked best or good for the first two, long-term effectiveness and permanence. Phytoremediation is a little better than the Alternative 4a because it involves permanence. Once you remove the contaminants, you don't have to worry about them being at another location. Short-term effectiveness, they are ranked about the same. Reduction of toxicity, mobility and volume through treatment, phytoremediation is the only alternative that we've retained for evaluation that is a treatment process. And so it's obviously ranked the best.

Implementability, these are readily implemented using construction equipment to build a containment. We have phytoremediation as being ranked as good because of the unknowns that exist.

A bench scale test to determine how many years we will have to do a field season to clean up these soils and how many different types of plants we will need to be conducted. So it's not as readily implementable. The costs are shown in the bottom. The costs for phyto are 2.8 million which would give the nod in this occasion. The next closest is on-site containment at an INEEL soils repository or RWMC and that's 5.9 million.

In summary, the Argonne National Lab has completed its Comprehensive Remedial Investigation/Feasibility Study. We had 37 sites specifically at WAG 9 and we've included two sites from WAG 10 in the proximity of WAG 9, and we've determined that 34 of those sites or areas require no additional action. We have identified nine areas with unacceptable risk, three areas for unacceptable human health risk based on the cesium-137, and we have identified eight areas with unacceptable ecological risks.

We have identified remedial alternatives and screened those alternatives and evaluated those alternatives and have determined along with DOE and the state EPA that Alternative 5 should be selected as the preferred alternative which involves the using of phytoremediation to extract these contaminants. Based on that, we have already started a bench scale testing back in the University of Chicago on our soils that we removed from the ANL-West Facility to determine which plants we should use if this is the selected alternative and what are the uptake or how much of the contaminants are removed from these soils.

I would just like to add one other thing. If the cesium were left in place, it would take 130 years to decay to the one in 10,000 risk level. So that incremental portion of the cesium that we have to remove from our soils is very small at this particular site, and phytoremediation has been used in the past, and we think it will work out very well for the Argonne Facility.

We're here tonight to get public perception of using phyto. We're here to answer your questions, and we would like to hear your comments on this preferred alternative and the other alternatives that we evaluated. The comment period started January 12th and runs through February 10th. We are scheduled to have our Record of Decision this summer which includes the Responsiveness Summary which are our answers to your questions tonight. And we're currently scheduled to begin implementing phytoremediation, if it is the selected alternative, this summer.

And with that, I would like to ask that Greg come up here, and if you have any questions concerning anything that we've presented tonight, to answer those.

AUDIENCE MEMBER: I have a couple of questions on the slide that you have on comparing the alternatives one to the other. I think three back or two. There you go. I'm curious to know why 3a, 4a and 4b only got a good on compliance as applicable on your ARARs? I do have a second question which I'll ask as well. Could you give us some idea on what has been done with phytoremediation, particularly any specific studies you can refer to and the details of those studies and what is known and what isn't known?

MR. LEE: The first question is compliance with ARARs. How come alternatives 3a, 4a and 4b are ranked as being good and phyto is ranked as being -- as the best. This is a consumer report type diagram. You have to remember that to retain these alternatives, they all have to be able to meet the laws. Phytoremediation actually goes through a treatment process to eliminate the potential risks of any ARARs. Once the contaminants are removed from the soil, the ability to treat the soil, we will not have the chance of having an unacceptable soil concentration for any of the ARARs. Does that make sense?

AUDIENCE MEMBER: Yes.

MR. LEE: These soils are going to be put in a containment system and will remain there and the laws are always changing, but once the phytoremediation is actually a treatment process and we do not have to worry once we meet the remedial action objectives of having a potential risk.

MR. KOCH: And if you look at this chart, it's like looking in a Consumers Report magazine which is basically what it is. You get a group of people in the three agencies, and if we discuss this probably another hour, we would probably change some of these things. It's very subjective other than probably the first two criteria. Beyond that it is really a discussion phase where we say, yeah, or, no, and say let's give it a half moon, let's give it a zero, let's give it a full moon. It is really a subjective process, but the good thing is we have three agencies bouncing these ideas off each other, and it's not that we pushed everyone to be on the right as the full moon to get the phytoremediation, but essentially it just did come out this way, low costs, and so it is subjective to some extent. You have to understand that.

AUDIENCE MEMBER: I do, but my understanding of the second is that it needs to comply with all applicable laws and appropriate laws that are out there. And so if you were to put it in a containment, for example in a landfill, you would build that landfill to meet all applicable requirements for that type of landfill, and so -- and you said that's got -- none of these will violate any law, but your point is that the phytoremediation will actually remove all the contaminants, hopefully, and in that sense, I think that is more protective of the human health and the environment, but I'm not going to quibble about whether the half moon or full moon. I just wanted to find out why you thought it didn't quite meet the requirements. It sounds like you think it did.

MR. LEE: To be retained, they have to meet requirements. We could have something ranked the worst, the whole empty circle, and it could still be retained. It's relative to each other, but they have to meet the minimum. Those are the threshold criteria for being retained. If you remember, we screened off a couple alternatives because they didn't meet that.

MR. BASS: All of our alternatives comply with all laws and all regulations. It's just that the treatment for these contaminants eliminates any risk of contamination escaping from your landfills years and years in the future. Our potential of becoming noncompliant with some regulation is greatly reduced with the treatment of the contaminants through phytoremediation, whereas with the landfill options -- that's what I call them -- there is always that potential that something may go wrong at the landfill. That's the only reason it got a whole circle and the rest of them got a half.

AUDIENCE MEMBER: My point is that would make protection of human health and the environment with 4a and 4b half moon. That would make compliance that they were also. But I'm not here to quibble.

MR. BASS: Who else had a question?

Okay. You said where in the world are they using phytoremediation to extract contaminants from soil. At a DOE facility at Ashtabula, Ohio. DOE is removing uranium from soil in Ashtabula, Ohio, for one thing. DOE is also -- or at least phytoremediation is being used right now in the Ukraine near the Chernobyl accident site for removal of cesium also. Argonne National Laboratory, particularly the Illinois facility, has done a lot of research on cesium extraction from cows' milk, water and other environmental media.

Army installations are using phytoremediation, using plants to extract chemicals used in the manufacture of explosives, and I will give you a free copy of really good literature on phytoremediation after the meeting. Who else had a question? Marty.

AUDIENCE MEMBER: The plants that you have under consideration, are they native plants or are they non-native plants? If they are non-native plants, what precaution do you have to make sure that the non-native plants don't start taking over our desert environment?

MR. BASS: That's a good question, Marty. We had the same concern. Presently in our greenhouse study back at Chicago, they are testing all kinds of different plants on our actual soil that we sent them from our ditches and pond bottoms using a variety of plants. We, of course, favor native plants, mainly because they need to be tough enough to take it out at the INEEL. Venus fly traps aren't going to cut it in eastern Idaho or Hawaiian pitcher plants or whatever those things are with the big flowers.

So I am prejudiced towards using native species. I advocate heavily using native species, and, in fact, willows and the poplar family, including aspen, are very promising plants for extracting out particular contaminants. I'd much rather see our ditches and pond bottoms covered with willows and aspen than Venus fly traps.

AUDIENCE MEMBER: I presume that when these plants that you harvested go to incineration, that the contaminants that you want to extract from the environment stay in the ash. What happens to the ash?

MR. BASS: That would be solidified according to the waste acceptance criteria for whatever radioactive waste landfill we would use. I want to go back up real briefly. I dodged part of my question. If we were to use non-native species, even a non-native variety of a native species, they would be cut and harvested before they could go to seed and reproduce. We were very concerned about that. We know that a lot of our stakeholders including the Shoshone and Bannock tribes are concerned about introducing non-native species. Are there any other questions?

AUDIENCE MEMBER: What of the contaminants will remain in the ash and what volume? Which, on your list, is cesium, arsenic and that.

MR. BASS: The cesium will remain in the ash or it will be trapped in a HEPA filteration system at the incinerator plant.

MR. LEE: To answer that question, some of the literature that Greg can hand out later tonight describing inorganics and phytoremediation, they are actually looking at some of the concentration of inorganics in the ash after incineration are so high they could actually recycle that material. That's not the case for the Argonne facility, but all of the inorganics would be in the sludge and in the ash. The ash is tested and then solidified and sent off to the appropriate facility.

AUDIENCE MEMBER: So this would be mixed waste?

MR. LEE: Potentially mixed waste. It depends upon the results. If you remember, we have distinct units for human health and distinct units for eco. We could send the RAD contaminated plant matter to an incinerator, typically the one at WERF, and we could send the inorganic sites off to a different incinerator where they do not have to have a license to incinerate RAD material.

AUDIENCE MEMBER: But some of the material will have -- I thought you said that there were sites that posed both human health and ecological.

MR. LEE: We have two sites that pose both. That is correct. But you have to remember again, once this is sent to the incinerator, the incinerator has acceptance criteria and they have to determine by sampling where they can dispose of that incinerated ash.

AUDIENCE MEMBER: Do commercial disposal facilities have concentration limits? I mean, if it is as you say, the inorganics are so consolidated that they can be recycled? Does a hazardous waste landfill -- automatically, can we assume that any facility could take it or would it be that particular facility? I don't think that I'm expressing this very well. How concentrated are the hazards in this waste going to be and is that concentration of hazard going to determine where it's disposed of rather than the constituents?

MR. BASS: That's exactly right. Our goal really is to get this ash -- to get the contaminants in this ash at a high concentration level. We don't want a bulk of waste to dispose of. That's the beauty of this whole thing is volume reduction. So the ash would be carefully analyzed before going to and a hazardous waste disposal facility which has a permit and the permit tells them the waste acceptance criteria and the analytical method that must be used before they would accept this ash.

So, yes, it would be heavily contaminated with heavy metals. The ash would be, but it would be disposed of at a hazardous waste facility which is permitted for those levels of heavy metals. More questions?

AUDIENCE MEMBER: You know, when you

move waste from one medium to another, there's spills and problems and stuff going around. With the exception of the potential for mixed waste, how about taking just cement and allowing cesium -- and covering, like, the ditches or something with cement and allowing the cesium to decay and eventually go away.

MR. BASS: It would take 130 years for the cesium to naturally go through its radioactive decay to a level where it doesn't pose any human health risk. Scott literally looked at dozens of alternatives to taking care of these sites. Was concreting one of them?

MR. LEE: Placing concrete on top of the ditches and assuming the concrete would last for 130 years is probably correct. But you haven't treated it, and the inorganics are always going to be there. You have cesium on one side and inorganics on the other. You eliminated the exposure pathway of the cesium to a receptor, but you haven't taken care of the inorganics. And you've made the assumption that they're going to be there or watching over 130 years. In the Argonne facility, we are currently targeted 35 years. We are kind of, quote, unquote, in the shutdown mode.

So we cannot guarantee that the concrete will still be there, so we feel it's better to treat it and meet the regs than to put a concrete cover on it. Does that make sense?

AUDIENCE MEMBER: Yes.

MR. LEE: Beatrice.

AUDIENCE MEMBER: Let me return to where we're going a take this ash. At the concentrations of the contaminants you assume will be in the ash, how many facilities in the county can take that?

MR. KOCH: Regardless of the concentration any facility that has a application permit can let's say this was RCRA waste. They did T-clip extraction from the RCRA waste. Before it's buried in that landfill, it would have to undergo a land ban treatment. It depends on what the metals are. I don't know off-hand, but they would have to meet that criteria before it could be buried in that facility. As you know the metals don't ever go away. They don't decay. So it's still always going to be there. It will be in a very concentrated parts per million quantity in this mass of incinerator residue, ash as we call it.

So we still have to meet some criteria for whatever RCRA authorized landfill it would go to. If it wasn't RCRA, it could go someplace with less stringent standards, so we don't know what the concentration will be, but just for instance we've seen concentration of several tens of thousands parts per million of some of these metals on some of these studies. So these plants do hyperaccumulate these metals. So we don't know the answer to that yet.

AUDIENCE MEMBER: I think the concern may be, though, how difficult do you anticipate it would be to find a facility that would accept the ash.

MR. KOCH: I don't think it's a concern at this point at all because I know there are facilities that will treat your waste so they can take your waste. It depends on how much it will cost. We don't have any studies on the leachability of that ash and that's what would have to be done. It takes quite a high concentration to reach of a T-clip standard to say it's a RCRA waste, but we don't have that yet.

AUDIENCE MEMBER: So it may have to be treated further before it would be --

MR. KOCH: That depends on the contaminant and the concentration. Yes, I don't think we could say that we might not have to. It just depends. Is that good enough?

MR. LEE: If I'm interpreting correctly what you're saying, Beatrice, that is a normal process for the incinerator and these wastes will be acceptable. The inorganics are readily acceptable. We can solidify those and send those to a landfill. The radionuclides, if we end up with a mixed waste, they are currently doing that with much, much higher contaminants than we're dealing with here for phytoremediation on the INEEL. Does that answer it?

AUDIENCE MEMBER: What's your timeline for treatment? You say you start -- when did you say?

MR. LEE: I can show you after we have run through three scenarios assuming 3 percent uptake, 4 percent uptake and 5 percent. If we assume 5 percent uptake per year for the cesium-137, at 5 percent, it takes four years to clean it up with phyto. If we assume 3 percent, we're talking about six years of growing plants at the INEEL in these ditches. I can show you those.

AUDIENCE MEMBER: And you're planning to start in '99? I can't remember.

MR. LEE: '98. We have a greenhouse study currently being conducted at the University of Chicago on our soil, and we are also sending them our water to simulate as closely as possible the conditions at the site.

AUDIENCE MEMBER: In your risk assessment, have you taken into consideration the possibility of fire that could go through any plant material that's growing on the site and release contaminants into the environment?

MR. BASS: I don't know what would make you worry about a fire at Argonne-West because we've had two in the last three years. That is a good consideration. In the type of plants that we select again, we're favoring the willow and poplar family and others that store contaminants primarily in their root system. The reason that we're favoring those types is we don't necessarily want deer and large, good-looking herbivores nibbling on leaves and stems of these plants that have a high concentration of the contaminants that we're trying remove here. So if a fire were to whip though, it would burn the leaves and stems in these ditch bottoms and leave the roots alone.

MR. LEE: I would just like to add one

thing. As Greg talked about these plants, willows, poplars, we're not going to create an oasis. They're going to be planted as a crop. They're going to be planted and grown really closely together. We're not talking 15-foot trees here. And they will be harvested similarly to a potato digger where you're going in and scooping up the roots along with the plant material, so we envision that the tree will only be about three or four and five feet tall and harvesting after one year. So we're not creating habitat for an owl or something like that.

AUDIENCE MEMBER: During harvesting, what's going to be done about dust control?

MR. LEE: We can use suppression methods. We typically use those during construction, and I'm assuming we would have to, again, use those for control. Remember, typically at most we're talking 5 percent uptake. You're dealing with much, much higher concentration than radionuclides and inorganics in paint. This isn't highly toxic so the controls are not quite as stringent. Dust suppression, keeping it wet, maybe a surfactant, a soap, combination. Beatrice.

AUDIENCE MEMBER: I have one more

question, or a comment. It seems to me if you're digging up the trees, you're half-way to digging up the soil, but let me ask a question. You said at the beginning we would be hearing more in the next couple months about -- I wrote down soil vault. I don't think that's the term you used, on-site soil repository. Could you give us a sneak preview?

MR. SIMPSON: Doug, do you want to talk about your repository?

MR. GREENWELL: And in that investigation which is similar to what you've heard tonight at WAG 8 and 9, there's Comprehensive Remedial Investigation/Feasibility Study that's been completed. We're preparing to go forth with the proposed plan the next couple of months. One of the alternatives that was evaluated at that site which has large volumes of similar types of soils as what you've heard here tonight, cesium-contaminated soil, predominantly, is to look at developing a consolidation unit not too dissimilar to the Naval Reactors Facility version where you take a contaminated area at the Chem Plant and convert it into an engineered disposal facility.

As part of that study we looked at the

fact that there are a large number of these sites across the INEEL at facilities like Argonne and NRF that have very similar types of contamination problems. What we're looking at is, if there is a way to get some synergy between these sites and develop one location that could be engineered to accept a large number of locations of soils of similar types to see if there's savings that could be realized by the government. So that alternative is one of many alternatives being evaluated in that study, and a proposed plan will be issued for public comment, I believe late March or April.

Right now we're preparing to go through a national remedy review board process with the Environmental Protection Agency, and once that process is complete, then the proposed plan will be completed and issued. By the way, Keith is also working on that project, so he gets around.

AUDIENCE MEMBER: So it's sized to take either the Chem Plant soil or sized to take the Chem Plant soil plus soil from other facilities; is that what you're saying?

MR. GREENWELL: That's correct. Those are the kinds of alternatives that were evaluated. We looked at the other INEEL, CERCLA generated soils that could be a result of these other comprehensive decisions.

MR. LEE: Any more questions?

MR. SIMPSON: Once again it's the time of the meeting where you can provide comments for the record, and once again, state your name and give your mailing address. Who would like to go first? Anyone? Okay. I would like to remind you that the comment period for both of those projects remains open until February 10th, and each one of these proposed plans has a comment form in the back, and you can write your comments down and put them in the mail to us. I would also like to say that next month we are going to be doing another round of meetings to discuss the Waste Area Group 1 which is Test Area North Comprehensive Remedial Investigation/Feasibility Study, and as Doug mentioned, we'll be back out on the road in late March or April to discuss the Chem Plant's Comprehensive Investigation.

And based on what I've seen, I've got some requests from media for briefings on that and Doug has been actively involved with the Citizens' Advisory Board. And based on that, I can say there's going to be a great deal of interest in the

Chem Plant Comprehensive Investigation. So I hope to see you for those upcoming meetings. Thank you.

(Meeting concluded at 10:00 p.m.)

STATE OF IDAHO)
) ss.
County of Ada)

I, N A N C Y S C H W A R T Z, a Notary Public in and for the State of Idaho, do hereby certify:

That said hearing was taken down by me in shorthand at the time and place therein named and thereafter reduced to computer type, and that the foregoing transcript contains a true and correct record of the said hearing, all done to the best of my skill and ability.

I further certify that I have no interest in the event of the action.

WITNESS my hand and seal this 23rd day of February, 1998.

Nancy Schwartz

Nancy Schwartz, Notary
Public in and for the
State of Idaho

My commission expires:
September 28, 1998